Table 9.—*Total number of days with precipitation from 1.01 to 2.00 inches, and with more than 2.00 inches, for the 5-year period 1907–1911, at selected stations in France and in the United States.*

France.			United States.		
Stations.	1.01 to 2.00 inches.	Over 2.00 inches.	Stations.	1.01 to 2.00 inches.	Over 2.00 inches.
	Days.	*Days.*		*Days.*	*Days.*
Nancy	5	0	New York, N. Y	36	9
Paris	3	0	Washington, D. C	39	6
Arras	1	0	Atlanta, Ga	42	8
Brest	1	1	Chicago, Ill	30	3
Marseille	9	4	St Louis, Mo	47	4
			New Orleans, La	63	29
			Denver, Colo	9	1
			Salt Lake City, Utah	3	0
			Seattle, Wash	16	0
			San Francisco, Cal	17	2

Authorities: Same as for Tables 7 and 8 above.

Table 10.—*Average number of days with snowfall, at stations in France and United States.*

Stations.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	Annual.
France:							
Paris—Parc St. Maur (1873–1903)[a]	1	3	4	3	3	1	15
Montdidier (1784–1869)[b]	1	3	4	3	3	1	15
Fécamp (1853–1882)[c]	0	2	2	2	2	0	8
Brussels, Belgium (1833–1850)[d]	1	4	6	5	5	2	23
United States:							
New York	......	......	......	......	......	......	20
Washington	......	......	......	......	......	......	14
Atlanta, Ga	......	......	......	......	......	......	7
Chicago, Ill	......	......	......	......	......	......	30
Kansas City, Mo	......	......	......	......	......	......	19
Oklahoma, Okla	......	......	......	......	......	......	7
Denver, Colo	......	......	......	......	......	......	33

[a] Annuaire de la Société Météorologique de France, 1905 (Paris).
[b] Annales du Bureau Central Météorologique de France, 1895.
[c] Annales du Bureau Central Météorologique de France, 1885.
[d] *Quetelet:* Climat de la Belgique, Bruxelles, 1857.
For the United States, see Table 8 above.

Table 11.—*Average cloudiness, in percentages of total sky, at selected station in France and Belgium and in the United States.*

The values given in this table for France and Belgium are averages for the various hours of observation and probably approximate the daily averages, the records in most cases covering periods of at least 10 years. Those for the United States represent the normal average daily cloudiness, *sunrise to sunset,* for a long period of years.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
France:	%	%	%	%	%	%	%	%	%	%	%	%	%
Dunkirk	72	71	63	59	57	58	55	63	60	71	79	72	65
Paris—Parc St. Maur	73	72	65	59	56	51	55	49	51	53	62	71	60
Rouen	65	64	58	56	51	52	49	52	58	61	67	67	58
Brest	71	71	70	64	56	67	64	60	61	66	75	64	66
Angers	68	61	57	50	52	53	54	53	56	61	69	69	59
Nantes	75	66	63	64	58	60	57	54	56	61	75	66	63
Besançon	60	64	58	55	51	53	48	48	49	59	65	65	55
Cluny	62	53	57	53	45	43	39	39	39	61	63	65	52
Nice	36	34	32	43	38	29	25	33	33	37	33	31	34
Marseille	47	47	41	46	46	36	23	30	42	44	42	49	41
Montpellier	39	38	36	40	36	31	26	28	35	39	40	41	36
Toulouse	68	57	57	59	57	55	44	45	50	52	61	66	56
Brussels, Belgium	77	78	71	62	63	67	63	65	58	65	75	79	69
United States:													
New York	58	54	56	54	53	51	51	51	48	48	54	56	53
Washington	58	54	55	50	50	48	46	48	45	45	51	54	50
Atlanta	57	55	51	49	47	50	54	54	47	38	45	53	50
Chicago	59	56	57	52	48	47	40	40	43	48	58	61	52
St. Louis	53	54	55	51	50	48	44	39	38	35	51	58	48
New Orleans	54	53	49	47	44	47	52	50	43	38	46	53	48
Denver	37	40	46	49	52	41	44	44	35	36	37	38	41
Salt Lake City	59	58	55	51	47	34	30	34	30	38	47	58	45
Seattle	77	71	64	60	65	58	42	42	56	67	75	79	63
San Francisco	53	49	48	41	40	35	41	43	33	35	42	50	43

Authorities:
France—Annales du Bureau Central Météorologique de France, 1884.
United States, as above.

Table 12.—*Prevailing wind directions and average relative humidities for Sèvres, Brussels, and Montpellier.*

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
	Prevailing winds.												
Sèvres (10 years)	SW	SW	W	SW	NE	W	W	W	W	SW	SW	SW	SW
Brussels (8 years)	SW	SW	SW	SW	SW	N	SW	SW	SW	SW	SW	SW	SW
	Average relative humidity.												
Sèvres (10 years)	%	%	%	%	%	%	%	%	%	%	%	%	%
7 a. m.	89	89	89	79	73	72	76	82	90	94	92	92	....
12 noon	78	69	60	51	51	51	54	55	58	68	76	80	....
9 p. m.	86	82	78	72	74	76	77	79	83	90	90	89	....
Montpellier (14 years):													
9 a. m.	82	76	70	67	62	58	56	57	66	71	80	80	....

Authorities: Annual reports of the French and Belgian meteorological services.

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FOG ALONG THE CALIFORNIA COAST.

By Andrew H. Palmer, Observer.

[Dated: Weather Bureau office, San Francisco, Cal., Oct. 15, 1917.]

When the Marine Exchange of the San Francisco Chamber of Commerce was asked what proportion of shipwrecks occurring along the California coast was due to fog, the reply was, "All of them." That exchange keeps a detailed record of all marine disasters occurring in the Pacific Ocean. The records previous to 1906 are no longer available, as they were destroyed in the fire which followed the San Francisco earthquake of April 18, 1906. But the record kept since that date is voluminous, for many shipwrecks have occurred. A cursory examination of this record showed that nearly all of those which occurred along the California coast were indirectly due to fog. The winds along the coast of California, though occasionally strong, are seldom of destructive violence. Hurricanes are practically unknown. Storms of the type which sweep the Atlantic coast of the United States every winter are of rare occurrence. At Point Reyes local winds often exceed 100 miles per hour in velocity, and the records include some of the highest winds ever recorded at sealevel in the United States. But these velocities, while true, are restricted to the immediate vicinity of the Point, and never occur along the routes followed by steamers. Along the California coast, clear-weather gales seldom cause more inconvenience to shipping than delayed schedules. But fog, which is unfortunately of frequent occurrence, and often of long duration, is a serious obstacle, and is without question the greatest menace to navigation.

Though there has been an increasing demand on the part of mariners for trustworthy fog data, the Weather Bureau, until recently, has been unable to render effective service in this matter. Though situated near the coast, the regular Weather Bureau stations at Eureka, San Francisco, San Luis Obispo, Los Angeles, and San Diego were nevertheless too far removed from the steamer lanes to secure the desired data. However, during the summer of 1916, an arrangement was effected between the Lighthouse Service and the Weather Bureau whereby the latter secures a report each month showing the number of hours of dense fog at each of 41 fog signal stations. (Throughout this discussion all references to "fog" imply "dense fog," the technical term used in the Weather Bureau describing the condition under which objects are invisible at a distance of 1,000 feet. No cognizance is here taken of light fog, where objects are visible at a greater distance than that named.) At these 41 stations, all but three of which are lighthouses, there are various kinds of fog signals in operation during times of fog, both by day and by night, and the keepers are instructed to keep an accurate record of the time. These reports are collected each month by the lighthouse inspector, San Francisco, who in turn forwards copies to the Section Centerof the Weather Bureau, at Sacramento, Cal., where they are published monthly in the "Climatological Data for the California Section."

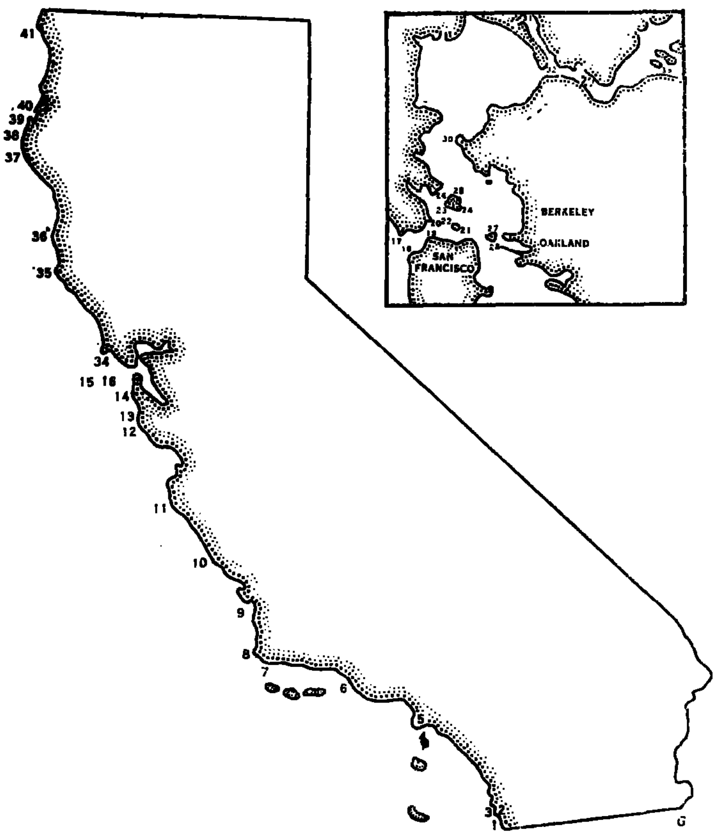

FIGURE 1.—Outline map of California indicating by reference numbers the approximate positions of fogsignal stations given in Tables 1 and 2. (Insert: Detail of San Francisco Bay stations.)

Table 1 gives the names of the 41 fog signal stations, the latitude and the longitude of each, the height of the light above high tide, and the kind of fog signal in use. The stations at Blunts Reef and San Francisco Light Vessel are on board vessels which are anchored in fixed positions in the steamer lanes. All the others are on headlands, rocks, or breakwaters closely adjacent to the routes followed by coastwise steamers, or those entering or leaving port. About one-half of these are situated in or near San Francisco Bay. The approximate positions of the 41 fog signal stations from which reports are received are shown graphically in figure 1, in which the numbers given refer to those stated in Table 1.

TABLE 1.—*Fog signal stations on the coast of California.*

Ref. Nos.	Lighthouse.	Latitude North.			Longitude West.			Height of light above high tide.*	Fog signal machinery.
		°	′	″	°	′	″	*Feet.*	
1	Point Loma	32	39	55	117	14	32	88	First-class air siren.
2	Ballast Point	32	41	11	117	13	58	34	Bell.
3	La Playa	32	42	11	117	14	05	28	Do.
4	Los Angeles Outer Harbor.	33	42	31	118	15	03	73	First-class air siren.
5	Los Angeles Inner Harbor.	33	43	15	118	16	13	(a)	Bell.
6	Point Hueneme	34	08	45	119	12	34	52	First-class air siren.
7	Point Conception	34	26	56	120	28	13	133	Air diaphone.
8	Point Arguello	34	34	41	120	39	00	100	First-class air siren.
9	San Luis Obispo	35	09	38	120	45	37	130	Do.
10	Piedras Blancas	35	39	57	121	17	01	158	Do.
11	Point Sur	36	18	24	121	54	03	270	Do.
12	Ano Nuevo Island	37	06	20	122	20	10	73	Do.
13	Pigeon Point	37	10	56	122	23	36	148	Do.
14	Point Montara	37	32	15	122	31	06	70	12-inch steam whistle.
15	Farallon Islands	37	41	58	123	00	04	358	Air diaphone.
16	San Francisco Light Vessel.	37	45	03	122	41	30	57	12-inch steam whistle.[b]
17	Bonita Point	37	48	57	122	31	44	124	First-class steam siren.
18	Mile Rocks	37	47	35	122	30	35	78	10-inch air whistle.
19	Fort Point	37	48	39	122	28	36	81	Air diaphone.
20	Lime Point	37	49	33	122	28	39	19	12-inch steam whistle.
21	Alcatraz Island, South Side.	37	49	36	122	25	17	214	Electric siren.
22	Alcatraz Island, North Side.	37	49	43	122	25	28	(a)	Do.
23	Angel Island	37	51	23	122	26	31	34	Bell.
24	Point Blunt	37	51	10	122	25	04	60	Electric siren.
25	Immigration Station	37	52	17	122	25	33	20	Bell.
26	Point Stuart	37	51	40	122	26	42	80	Electric siren.
27	Goat Island	37	48	28	122	21	41	95	10-inch steam whistle.
28	Oakland Harbor	37	48	02	122	19	51	43	Bell.
29	Southampton Shoal	37	52	56	122	23	58	52	Do.
30	East Brother Island	37	57	49	122	25	58	61	12-inch steam whistle.
31	Mare Island	38	04	26	122	15	15	74	Bell.
32	Carquinez Strait	38	04	15	122	14	32	56	First-class air siren.
33	Roe Island	38	04	07	122	01	40	41	Bell.
34	Point Reyes	37	59	45	123	01	21	294	Air diaphone.
35	Point Arena	38	57	19	123	44	24	155	First-class air siren.
36	Point Cabrillo	39	20	56	123	49	31	84	Do.
37	Punta Gorda	40	15	03	124	20	57	75	Do.
38	Blunts Reef	40	26	04	124	30	14	50	12-inch steam whisthe.[b]
39	Humboldt Table Bluff	40	41	45	124	16	24	176	First-class air siren.
40	Humboldt Bay	40	45	41	124	13	18	(a)	Do.
41	St. George Reef	41	50	15	124	22	28	146	Do.

* Fog signals are sometimes at a different altitude.
[a] No light.
[b] Also a submarine bell.

DURATION OF FOG.

Table 2 summarizes the duration of fog at 41 fog signal stations of California for a period of one year. So far as is known, this is the first time such complete fog data collected along the California coast and covering a year of time, have been assembled and published.[1] The year was an ordinary one from a meteorological standpoint, and may safely be regarded as typical. The summary presents interesting details. The summer months had the most fog, the greatest amount having occurred in September. The winter months had the least fog, the smallest amount having occurred in March. During August, 1917, Humboldt Table Bluff had 442 hours of fog, or 59 per cent of the month; at Blunts Reef during the same month there were 418 hours of fog, or 56 per cent of the month. At Point Reyes, where the sun is sometimes hidden by fog for three and four weeks at a time, there were 370 hours of fog during July, 1917, or 51 per cent of that month. On account of its persistent fog mantle, Point Reyes has the unique distinction of being the coolest place in the United States during the midsummer months.

[1] See, however, *U. S. Bureau of Lighthouses*. The United States Lighthouse Service, 1915. Washington, 1916. Also this REVIEW, January, 1916, 44: 21, and the present issue, p. 499.

It is apparent from the table that from Point Arguello northward fog is of frequent occurrence, particularly during the summer months. Point Arguello, where the fogs are invariably thick, is recognized among mariners to be one of the most dangerous points on the Pacific Coast. The Golden Gate, the entrance to San Francisco Bay, is also a region of frequent fog, and shipwrecks have been numerous as a result. Most prominent of these was the wreck, on Fort Point Reef, on February 22, 1901, of the steamer *Rio de Janeiro* with the loss of 127 lives. Near Blunts Reef, another region of excessive fog, the passenger steamer *Bear*, valued at more than $1,000,000, went ashore in the summer of 1916 during a dense fog. Five lives were lost and the vessel is still breaking up on the beach. In the immediate vicinity of Humboldt Bay, the harbor of Eureka, a total of 19 shipwrecks have occurred in the past 10 years, all due indirectly to fog. Notable among these was the stranding, during January, 1917, of U. S. submarine *H-3* during a fog. Though this vessel was finally salvaged, the U. S. S. *Milwaukee* (9,700 tons displacement), in attempting to rescue her went ashore during a fog and was a total loss. No large vessel has ever been refloated from these shoals, and many have found graves there.

TABLE 2.—*Duration of fog (hours) at fog signal stations on the coast of California September, 1916, to August, 1917.*

[Authority: U. S. Lighthouse Service.]

Ref. Nos.	Lighthouse.	1917. January.	February.	March.	April.	May.	June.	July.	August.	1916. September.	October.	November.	December.	Year. Total.	Per cent.
		Hr.	Hr.	Hr.	Hr.	Hr.	Hr.	Hr.	Hr.	Hr.	Hr.	Hr.	Hr.	Hr.	
1	Point Loma	3	22	31	9	0	75	6	0	10	26	47	40	269	3
2	Ballast Point	4	22	11	8	0	44	2	0	11	22	68	51	243	3
3	La Playa	7	21	11	11	0	51	1	0	22	35	81	50	290	3
4	Los Angeles Outer Harbor	51	68	47	49	10	51	28	15	98	83	105	91	696	8
5	Los Angeles Inner Harbor	31	43	27	22	1	32	4	18	79	52	65	69	433	5
6	Point Hueneme	12	25	18	43	4	59	44	34	102	101	67	36	545	6
7	Point Conception	13	31	2	29	1	50	111	15	81	16	41	29	419	5
8	Point Arguello	14	40	26	124	32	100	357	108	230	28	68	70	1,197	14
9	San Luis Obispo	1	27	3	83	17	73	345	86	236	42	20	80	1,013	12
10	Piedras Blancas	14	33	20	93	23	54	356	76	280	26	49	68	1,092	12
11	Point Sur	7	36	43	76	22	98	204	103	252	54	30	38	963	11
17	Ano Nuevo Island	36	52	36	84	15	71	150	62	258	67	50	101	982	11
13	Pigeon Point	22	49	34	75	10	63	151	53	231	73	44	72	877	10
14	Point Montara	42	69	48	87	36	94	156	65	264	109	36	74	1,080	12
15	Farallon Island	28	96	56	107	33	85	171	111	223	79	28	46	1,063	12
16	San Francisco Light Vessel	88	146	53	102	31	129	239	250	304	178	48	122	1,690	19
17	Bonita Point	70	85	27	100	16	78	145	68	281	91	51	74	1,086	12
18	Mile Rocks	52	71	27	69	21	75	136	69	251	84	40	57	952	11
19	Fort Point	60	68	11	80	8	62	133	74	238	86	48	69	937	11
20	Lime Point	52	61	22	66	6	60	118	49	235	77	40	62	848	10
21	Alcatraz Island, South Side	53	42	14	28	1	44	105	41	159	45	27	40	599	7
22	Alcatraz Island, North Side	56	48	18	39	2	50	82	50	185	53	33	46	662	8
23	Angel Island	18	9	10	8	0	0	13	0	11	11	10	10	100	1
24	Point Blunt	45	35	13	24	0	28	72	29	132	36	17	29	460	5
25	Immigration Station	1	9	3	0	0	0	0	0	3	25	3	1	45	1
26	Point Stuart	25	9	10	3	0	0	7	0	9	14	10	11	98	1
27	Goat Island	36	10	6	3	0	0	1	0	11	23	17	15	122	1
28	Oakland Harbor	26	11	4	0	0	0	0	0	9	11	9	10	80	1
29	Southampton Shoal	34	14	8	6	0	6	14	1	15	26	13	12	149	2
30	East Brother Island	37	12	10	3	0	0	2	0	3	23	22	5	120	1
31	Mare Island	66	16	4	6	....	0	5	0	4	31	21	22	175	2
32	Carquinez Strait	77	19	8	7	0	0	5	7	5	31	20	21	200	2
33	Roe Island	75	8	0	1	0	0	0	0	0	16	9	30	139	2
34	Point Reyes	86	179	67	158	96	158	370	326	313	167	70	117	2,107	24
35	Point Arena	14	84	40	74	35	108	301	232	214	110	22	60	1,294	15
36	Point Cabrillo	11	69	56	49	33	130	280	275	191	132	19	53	1,298	15
37	Punta Gorda	9	20	54	35	14	95	134	143	166	79	9	22	780	9
38	Blunts Reef	54	106	77	99	89	148	251	418	186	140	31	84	1,683	19
39	Humboldt Table Bluff	53	127	28	60	81	161	253	442	195	175	50	60	1,685	19
40	Humboldt Bay	60	118	29	35	26	134	141	257	228	223	77	74	1,402	16
41	Saint George Reef	13	52	17	34	39	130	135	361	136	174	41	12	1,144	13
	Means: Number of hours	35.5	50.3	25.1	48.5	17.1	63.3	122.6	93.4	143.0	70.1	38.0	49.6	756.5	9
	Per cent	5	7	3	7	2	9	17	13	19	9	5	7	9	...

Since fog can not directly cause shipwreck, its influence is always indirect, and it is almost invariably aided and abetted by a strong current or brisk winds. A treacherous undercurrent occurs at many points along the Pacific coast, causing a vessel to "set" as the navigators term it. However, fog remains the principal contributing cause, since few shipwrecks would occur along the coast of California if there were no fog. When for days at a time navigators are unable to determine a ship's position by the usual astronomical methods, navigation is necessarily hazardous. Even when the position is known there is danger of collision with another vessel. Cautious navigators therefore usually proceed at slow speed during a fog, if they proceed at all.

THE NATURE OF FOG ALONG THE CALIFORNIA COAST.

The nature of California coast fog has long been known to meteorologists, but a brief description would seem appropriate here. Broadly speaking, it may be separated into two classes, Summer fog and Winter fog. These will be discussed separately in the following:

Summer fog.—During the summer months the entire California coast has a more or less persistent fog bank offshore and extending westward a distance of approximately 50 miles. The bank seldom exceeds 2,000 feet and is usually about 1,500 feet in vertical thickness. During the summer half-year, atmospheric conditions in California are dominated by the extensive North Pacific HIGH, which is a region of weak barometric gradients and hence of little wind movement. However, the excessive heating from insolation of the great interior valleys of California causes the air over the interior to rise, its place being taken by air drawn in from the west, the high Sierra Nevada preventing air coming in from the east. At places where there are breaks in the Coast Range the indraught of air is marked. Wind velocities of 25 to 30 miles per hour occur regularly every summer afternoon near the Golden Gate. This indraught of air from the west brings in the ocean fog to the land, but it usually dissipates or becomes high fog or cloud before penetrating far. It should be noted that the fog originates over the ocean and occasionally is drawn in over the land.

The origin of the summer type of fog is principally the mixing of masses of air differing in temperature and relative humidity, the temperature of the resulting mixture being below the dew of the mass and partial condensation resulting. Various investigations, notably those by the Scripps Institution for Biological Research, have demonstrated that there is an upwelling of relatively cold water along the California coast. The temperature of the surface water near the coast is distinctly lower than that farther west. During the summer months of anticyclonic control, when there is a diminished gradient and little cyclonic wind movement, the air over this region of relatively cold water is also relatively cold, as well as almost saturated. As the superincumbent air receives little or no heat from the cold surface water, it cools and therefore approaches its dewpoint. Moreover, the indraught over the interior, of air from the west, reinforces the prevailing westerly winds, and causes a slow but well-defined west to east movement. Over the upwelling water there is a mixing of the relatively cold and almost saturated local air with slightly warmer air coming in from a more westerly region. The latter air is also almost staurated because of the wide expanse of ocean surface over which it has passed. In the mixing the dewpoint is reached, and a portion of the invisible water vapor is condensed to form the visible moisture particles which collectively are known as fog. Fog is simply a cloud in contact with the land or the ocean.

As the summer type of fog is principally due to the mixing of air masses differing in relative humidity and in temperature, it seldom results in measurable precipitation. Air masses which ascend and therefore expand and cool produce precipitation much more effectively. Though it is foggy along the California coast about 50 per cent of the time during the summer months, practically no precipitation is recorded. Certain kinds of vegetation have, through a long-continued process of adapting themselves to their environment, learned to precipitate water from the fog. For example, the redwood (*Sequoia sempervirens*), one of the most typical of California trees, has so successfully learned the art of precipitating mositure from fog that such a grove is dripping wet during a fog. It is a significant fact that this tree is found only in a narrow belt along the coast, and never more than 30 miles inland. Recent determinations show that the amount of liquid water in the densest fogs is very small;[2] but large areas collect large amounts and perhaps some day irrigation will be aided by the use of some device for precipitating water from fog as successfully as the redwood tree does it.

Winter fog.—Winter fog is less common than the summer type, and differs from it also in being of land origin. It occurs in all portions of California, and occasionally moves seaward, though it does not often go far offshore. It is very superficial, usually being but 100 to 200 feet deep. However, it resembles the summer type of fog in that it requires a weak barometric gradient for its formation, and vigorous wind movement prevents it from forming. It can be anticipated during the winter when a large high pressure area impinges upon the coast, and subsequently moves slowly southeastward. In California it is locally known as "tule fog" as it is of most frequent origin over tule lands which are swamps and marshes filled with tule or Mexican bulrush of the genus Scirpa. During the night, when stagnant air lies in contact with moist ground it loses heat through radiation aloft and through conduction to the ground. If the lowering of temperature proceeds far enough, partial condensation results in the formation of a "tule fog." This fog will persist until it is dried up by the sun from above, or is laterally displaced by cyclonic wind movement. As a factor in navigation it is less dangerous than summer fog because it is less frequent, is very shallow, and is not found far offshore. Navigators can often avoid it by taking an outside course. Occasionally, a lookout stationed at the top of the mast can see over the fog stratum, thus largely removing the danger of running ashore.

In California and vicinity the barometric conditions of Summer are wholly different from those of Winter. So, too, are the fogs, which are largely dependent on barometric gradients and the resulting winds. While the summer type of fog occasionally occurs in winter, it is uncummon, because the Aleutian LOW then controls the weather of the North Pacific. The air is then cooler than the water, and contact between the two causes a rise in the temperatire of the air rather than a fall, and hence a tendency to dispel fog.

SUMMARY.

Fog is the principal contributing cause of most of the marine disasters along the coast of California. When a ship is wrecked through going ashore or by collision, it is usually during a period of fog. Fog prevails during a large part of the time, approximately 50 per cent of the summer months being foggy. Summer fogs originate over the ocean, are due primarily to the mixing of air masses differing in temperature and relative humidity, and coincide in extent largely with the upwelling of relatively cold water. Winter fogs, of land origin, are shallow in depth, and are caused by the cooling and partial condensation of the mositure in a stagnant mass of air lying in contact with moist ground. Both types of fog are associated with anticyclonic conditions, for they are dispelled by well-defined gradients and the resulting winds.

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RELATIVE FREQUENCY OF FOG AT UNITED STATES LIGHTHOUSES.[3]

UNITED STATES BUREAU OF LIGHTHOUSES.

Fog is more generally prevalent throughout the first district than any other, as shown by the following table, from which it will be seen that out of 29 stations in the entire service, averaging over 1,000 hours of fog per year, 14 or practically one-half are in that locality.

District.	Station.	Average hours of fog per year.	Length of record.	Per cent of fog based on entire period.
		Hours.	*Years.*	*Per cent.*
1	Petit Manan, Me	1,691	31	19
1	Whitehead, Me	1,544	31	18
1	Libby Islands, Me	1,536	31	17
1	Matinicus Rock, Me	1,399	31	16
1	Great Duck Island, Me	1,384	25	16
1	West Quoddy Head, Me	1,372	31	16
1	Moose Peak, Me	1,356	3	15
1	Egg Rock, Me	1,341	11	15
18	Point Reyes Light, Cal	1,337	31	15
1	Seguin, Me	1,331	31	15
1	Mount Desert, Me	1,304	24	15
1	Little River, Me	1,219	10	14
1	The Cuckolds, Me	1,208	23	14
17	Swiftsure Bank Light Vessel, Wash	1,203	9	14
12	Calumet Harbor, Ill	1,196	9	14
1	Pollock Rip Slue Light Vessel, Mass	1,175	14	13
18	Bonita Point, Cal	1,143	31	13
1	Manana Island, Me	1,116	31	13
18	Point Arena, Cal	1,076	31	12
18	Blunts Reef Light Vessel, Cal	1,065	10	12
2	Great Round Shoal Light Vessel, Mass	1,064	23	12
1	Nash Island, Me	1,063	10	12
2	Pollock Rip Light Vessel, Mass	1,061	31	12
18	Point Cabrillo, Cal	1,045	7	12
18	Humboldt, Cal	1,037	7	12
18	San Luis Obispo, Cal	1,027	25	12
2	Nantucket Shoals Light Vessel, Mass	1,005	23	11
18	San Francisco Light Vessel, Cal	1,004	18	11
2	Gloucester Breakwater, Mass	1,002	4	11

[2] *United States Coast Guard.* International ice observation and ice patrol service in the North Atlantic Ocean, February to July, 1915. Washington, 1916, pp. 65–72. (U. S. Coast Guard, bulletin No. 5.)

[3] Quoted from *U. S. Bureau of Lighthouses.* The United States lighthouse service, 1915. Washington, 1916. 94 p. 8°. See p. 49.